

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) An emission control system for controlling NOx and NH₃ emissions from an exhaust stream, the system comprising:
a lean NOx trap in communication with the exhaust stream for reducing NOx emissions wherein the lean NOx trap is optimized for NH₃ generation by removing oxygen storage capacity of the lean NOx trap; and
a NH₃-SCR catalyst in communication with the exhaust stream for adsorbing NH₃, wherein the NH₃ adsorbed by the NH₃-SCR catalyst reacts with NOx in the exhaust stream to improve the reduction of NOx and NH₃.
2. (Currently Amended) The emission control system of claim 1, wherein one or more alternating layers of the lean NOx trap and the NH₃-SCR catalyst are provided in a single catalytic converter shell such that a top layer comprising the lean NOx trap positioned over a bottom layer comprising the NH₃-SCR catalyst is repeated one or more times.
3. (Currently Amended) The emission control system of claim 1, wherein one or more alternating layers of the lean NOx trap and NH₃-SCR catalyst are provided in a single substrate such that a top layer comprising the lean NOx trap positioned over a bottom layer comprising the NH₃-SCR catalyst is repeated one or more times.
4. (Currently Amended) The emission control system of claim 1, wherein one or more alternating zones of the lean NOx trap and NH₃-SCR catalyst are provided in a single catalytic converter shell such that an upstream zone comprising the lean NOx trap positioned upstream of a downstream zone comprising the NH₃-SCR catalyst is repeated one or more times.

5. (Original) The emission control system of claim 4, wherein each alternating zone of the lean NO_x trap and alternating zone of the NH₃-SCR catalyst have a 1" length and 1" width.

6. (Original) The emission control system of claim 4, wherein each alternating zone of the lean NO_x trap and alternating zone of the NH₃-SCR catalyst have a ½" length and a width of ½".

7. (Original) The emission control system of claim 4, wherein each alternating zone of the lean NO_x trap and alternating zone of the NH₃-SCR catalyst have a length of ¼" and a width of ¼".

8. (Currently Amended) The emission control system of claim 1, wherein one or more alternating zones of the lean NO_x trap and NH₃-SCR catalyst are provided in a single substrate such that an upstream zone comprising the lean NO_x trap positioned upstream of a downstream zone comprising the NH₃-SCR catalyst is repeated one or more times.

9. (Original) The emission control system of claim 1, wherein the lean NO_x trap generates a sufficient quantity of NH₃ to force the reaction between NO_x and NH₃, whereby NH₃ emissions are eliminated and net NO_x conversion improved.

10. (Original) The emission control system of claim 1, wherein the lean NO_x trap is optimized for NH₃ generation by removing oxygen storage capacity of the lean NO_x trap.

11. (Original) The emission control system of claim 1, wherein the lean NO_x trap comprises a precious metal selected from the group consisting of platinum, palladium, rhodium and combinations thereof; and a NO_x storage material selected from the group consisting of alkali metals, alkali earth metals, rare earth metals and

combinations thereof.

12. (Original) The emission control system of claim 1, wherein the lean NO_x trap comprises platinum.

13. (Original) The emission control system of claim 1, wherein the lean NO_x trap comprises a composite of cerium and zirconium.

14. (Original) The emission control system of claim 1, wherein the lean NO_x trap comprises one or more materials for NH₃ generating and NO_x storage.

15. (Original) The emission control system of claim 1, wherein the NH₃-SCR catalyst comprises one or more NH₃ adsorbing materials, wherein the NH₃ adsorbing materials are capable of converting NO_x and NH₃ to nitrogen.

16. (Original) The emission control system of claim 1, wherein the NH₃-SCR catalyst comprises a base metal and a support selected from the group consisting of alumina, silica titania, zeolite and their combinations.

17. (Original) The emission control system of claim 1, wherein the NH₃-SCR catalyst comprises a metal selected from the group consisting of Cu, Fe and Ce and a zeolite.

18. (Currently Amended) The emission control system of claim 1, wherein the lean NO_x trap and the NH₃-SCR catalyst are placed in a single catalytic converter shell.

19. (Original) The emission control system of claim 1, wherein the NH₃-SCR catalyst is separate from and downstream from the lean NO_x trap.

20. (Original) An emission control system for controlling NO_x and NH₃ emissions from an exhaust stream produced by the combination of an air/fuel mixture in an internal combustion engine, the system comprising:

a lean NO_x trap in communication with the exhaust stream for NO_x reduction wherein the lean NO_x trap comprises a lean NO_x trap formulation which includes one or more NO_x storage and NH₃ generating materials;

a NH₃-SCR catalyst in communication with the exhaust stream for adsorbing NH₃, wherein the NH₃-SCR catalyst comprises a NH₃-SCR catalyst formulation which includes one or more NH₃ adsorbing materials; and

wherein the lean NO_x trap formulation and the NH₃-SCR catalyst formulation are placed on one substrate.

21. (Original) The emission control system of claim 20, wherein a layer of the lean NO_x trap formulation and a layer of the NH₃-SCR catalyst formulation are placed on the substrate to form a two-layer washcoat.

22. (Original) The emission control system of claim 20, wherein the lean NO_x trap formulation and the NH₃-SCR catalyst formulation are homogeneously mixed to form a single washcoat layer on the substrate.

23. (Original) The emission control system of claim 20, wherein the lean NO_x trap formulation and the NH₃-SCR catalyst formulation are heterogeneously mixed to form a single washcoat layer on the substrate.

24. (Original) An emission control system for controlling NO_x and NH₃ emissions from an exhaust stream produced by the combination of an air/fuel mixture in an internal combustion engine, the system comprising:

a lean NO_x trap in communication with the exhaust stream;

a NH₃-SCR catalyst in communication with the exhaust stream for adsorbing

NH₃, wherein the NH₃ adsorbed by the NH₃-SCR catalyst reacts with NO_x in the exhaust stream to improve NO_x and NH₃ reduction; and

wherein the lean NO_x trap and the NH₃-SCR catalyst are provided in one substrate.

25. (Currently Amended) The emission control system of claim 24, wherein one or more alternating zones of the lean NO_x trap and NH₃-SCR catalyst are provided, each zone having a 1" width such that an upstream zone comprising the lean NO_x trap positioned upstream of a downstream zone comprising the NH₃-SCR catalyst is repeated one or more times.

26. (Original) The emission control system of claim 24, wherein alternating zones of the lean NO_x trap and NH₃-SCR catalyst are provided, each zone having a ½" width.

27. (Original) The emission control system of claim 24, wherein alternating zones of the lean NO_x trap and NH₃-SCR catalyst are provided, each zone having a ¼" width.

28. (Original) The emission control system of claim 24, wherein the lean NO_x trap and the NH₃-SCR catalyst are placed in one or more alternating layers in the substrate.

29. (Original) An emission control system for controlling NO_x and NH₃ emissions from an exhaust stream produced by the combination of an air/fuel mixture in an internal combustion engine, the system comprising:

a lean NO_x trap in communication with the exhaust stream;

a NH₃-SCR catalyst in communication with the exhaust stream for adsorbing NH₃, wherein the NH₃ adsorbed by the NH₃-SCR catalyst reacts with NO_x in the exhaust stream to improve NO_x and NH₃ reduction; and

wherein the lean NOx trap and NH₃-SCR catalyst are provided in a single catalytic converter shell.

30. (Currently Amended) An emission control system for controlling NOx and NH₃ emissions from an exhaust stream produced by the combination of an air/fuel mixture in an internal combustion engine, the system comprising:

a lean NOx trap in communication with the exhaust stream for NOx reduction, to provide a NOx reducing exhaust stream including NOx and NH₃, wherein the lean NOx trap is optimized for NH₃ generation by removing oxygen storage capacity; and

a NH₃-SCR catalyst in communication with the exhaust stream for adsorbing NH₃, wherein the NH₃ adsorbed by the NH₃-SCR catalyst reacts with NOx in the NOx reduced exhaust stream to improve the reduction of NOx and NH₃.

31. (Original) The emission control system of claim 30, wherein the lean NOx trap generates a sufficient quantity of NH₃ to force the reaction between NOx and NH₃, whereby NH₃ emissions are eliminated and net NOx conversion improved.

32. (Cancelled)

33. (Original) The emission control system of claim 30, wherein the lean NOx trap comprises a precious metal selected from the group consisting of platinum, palladium, rhodium and combinations thereof; and a NOx storage material selected from the group consisting of alkali metals, alkali earth metals, rare earth metals and combinations thereof.

34. (Original) The emission control system of claim 30, wherein the lean NOx trap comprises platinum.

35. (Original) The emission control system of claim 30, wherein the lean NOx trap comprises a composite of cerium and zirconium.

36. (Withdrawn) A method of controlling NOx and NH₃ emissions from an exhaust stream produced by the combination of an air-fuel mixture in an internal combustion engine, comprising:

providing a lean NOx trap in communication with the exhaust stream; and
providing an NH₃-SCR catalyst in communication with the exhaust stream for adsorbing NH₃, wherein the NH₃ adsorbed by the NH₃-SCR catalyst reacts with NOx in the exhaust stream.

37. (Withdrawn) A catalyst system for controlling diesel particulates, comprising:

a porous substrate, including a washcoat containing lean NOx trap and NH₃-SCR catalyst formulations, wherein the porous substrate filters diesel particulates.

38. (Withdrawn) A method of controlling diesel particulates from a diesel exhaust stream comprising:

providing a porous substrate;
incorporating a washcoat comprising lean NOx trap and NH₃-SCR formulations into the porous substrate; and
passing the diesel exhaust stream through the porous substrate to filter diesel particulates.

39. (Original) An emission control system for controlling NOx and NH₃ emissions from an exhaust stream produced by the combination of an air/fuel mixture in an internal combustion engine, the system comprising:

a three-way catalyst in communication with the exhaust stream to reduce NOx emissions and produce NH₃, wherein the three-way catalyst comprises platinum on an outer surface of the three-way catalyst to optimize the formation of NH₃, and wherein the three-way catalyst is further optimized for NH₃ generation by removing oxygen storage capacity of the three-way catalyst; and

an NH_3 -SCR catalyst in communication with the exhaust stream for adsorbing NH_3 , wherein the NH_3 adsorbed by the NH_3 -SCR catalyst reacts with NO_x in the exhaust stream to improve the reduction of NO_x and NH_3 .